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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte CAITLIN OSWALD, JESSE R. BOYER,
and JOHN P. RIZZO, JR.

Appeal 2019-004150
Application 15/011,969
Technology Center 1700

Before JEFFREY T. SMITH, BRIAN D. RANGE, and
MERRELL C. CASHION, JR., *Administrative Patent Judges*.

SMITH, *Administrative Patent Judge*.

DECISION ON APPEAL

Pursuant to 35 U.S.C. § 134(a), Appellant¹ appeals from the Examiner's decision to reject claims 1–9 and 20–25.² We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM IN PART.

¹ We use the word “Appellant” to refer to “applicant” as defined in 37 C.F.R. § 1.42. Appellant identifies the real party in interest as United Technologies Corporation. (Appeal Br. 2.)

² Pending claims 10–19 are withdrawn from consideration. (Final Act. 1; Appeal Br. 4.)

STATEMENT OF THE CASE

Claims 1 illustrates the subject matter on appeal and is reproduced below:

1. A component, comprising:
an additively manufactured component with an internal passage; and
a multiple of ultrasonic horns additively manufactured within the internal passage to clean the internal passage of conglomerated powder subsequent to additive manufacturing of the component.

(Appeal Br. 16, Claims Appendix.)

Appellant requests review of the following rejections from the Examiner's Final Office Action:³

I. Claims 20–24 rejected under 35 U.S.C. § 112(a) as failing to comply with the written description requirement.

II. Claims 4, 6, 8, 9, 20, 22, and 24 rejected under 35 U.S.C. § 112(b) as indefinite.

III. Claims 1–9 and 20–25 rejected under 35 U.S.C. § 103 as unpatentable over Tsai (US 2010/0327072 A1, December 30, 2010), Kinley (US 2005/0136520 A1, June 23, 2005), and Ford (GB 2517490 A, February 25, 2015).

OPINION

Written Description Support

The Examiner determines the recitation “the input section of one ultrasonic horn extends at least partially into the output section of a

³ The complete statement of the rejections on appeal appears in the Final Office Action. (Final Act. 2–15.)

subsequent ultrasonic horn to form a chain of ultrasonic horns” or “the chain of ultrasonic horns extend along the entirety of the internal passage” is not supported by the written description of the Specification. (Final Act. 3.)

Appellant does not contest this rejection. (*See generally* Briefs.) 37 C.F.R. § 41.37(c)(1)(iv); *see also* Manual of Patent Examining Procedure (MPEP) § 1205.02 (9th ed. Jan. 2018) (“If a ground of rejection stated by the examiner is not addressed in the appellant’s brief, appellant has waived any challenge to that ground of rejection and the Board may summarily sustain it, unless the examiner subsequently withdrew the rejection in the examiner’s answer.”).

Accordingly, we summarily sustain the Examiner’s rejection of claims 20–24 under 35 U.S.C. § 112(a) for the reason the Examiner provides.

Indefiniteness

Claims 4 and 22

The Examiner determines the phrase “non line of sight” renders claims 4 and 22 indefinite because it is unclear what is meant by this phrase and how the internal passage can be “non line of sight.” (Final Act. 4.)

Appellant respectfully submits that usage of the term “non line of sight internal passage” is readily understood and the Examiner accurately describes said passage in the first full paragraph of page 4 in the Final Action. (Appeal Br. 9.) Specifically, the Examiner states “[f]or purposes of this office action, it will be interpreted as the additively manufactured component is bent such that there is no line of sight through the internal passage from one end of the component to the other end.” (Final Act. 4.)

We do not sustain the rejection of claims 4 and 22 under 35 U.S.C. §

112(b) as indefinite for the reasons Appellant presents.

Claim 6

The Examiner determines the phrase “the output section smaller extends at least partially within the input section” renders the claim indefinite because it is unclear how the output section can be partially within the input section if they are on opposite ends of the horns. (Final Act. 4.)

Appellant respectfully submits that this phrase is also definite for the same reasons presented with regard to claims 20–24. (Appeal Br. 10.)

We sustain the rejection of claim 6 under 35 U.S.C. § 112(b) as indefinite for the reasons the Examiner presents. (Final Act. 4.)

Claims 8, 9, and 24

The Examiner determines the phrase “natural frequency” renders the claims indefinite because it is unclear what is meant by this phrase or what frequencies are considered “natural.” (Final Act. 4.)

Appellant responds:

[T]he geometry of the ultrasonic horns can also be designed to particular known natural frequencies, with considerations to avoid the natural frequencies of the actual additively manufactured component, see paragraph [0038]. One of ordinary skill in the art will readily understand what a natural frequency of a component is and how to avoid such.

(Appeal Br. 10.)

We sustain the rejection of claims 8, 9, and 24 under 35 U.S.C. § 112(b) as indefinite. Appellant has not directed us to evidence that provides an explanation of known natural frequencies as required by the claimed invention.

Claim 20

The Examiner determines the phrase “the input section of one ultrasonic horn extends at least partially into the output section of a subsequent ultrasonic horn to form a chain of ultrasonic horns” renders the claim indefinite because it is unclear how the input section can extend into the output section when the output section is smaller than the input. (Final Act. 4.)

Appellant argues “that claim 20 is also definite as disclosed and illustrated in which the input section can extend into the output section.” (Appeal Br. 10.)

We sustain the rejection of claim 20 under 35 U.S.C. § 112(b) as indefinite for the reasons the Examiner presents. Appellant has not specifically identified which Figures and portions of the Specification support the argument.

In summary, we sustain the Examiner’s rejection of claims 6, 8, 9, and 24 under 35 U.S.C. § 112(b) for the reason the Examiner provides but reverse the Examiner’s rejection of claims 4 and 22 under 35 U.S.C. § 112(b) for the reasons Appellant provides.

Prior Art Rejection

After review of the respective positions Appellant and the Examiner provide, we determine that Appellant has demonstrated reversible error in the Examiner’s rejection under 35 U.S.C. § 103. We limit our discussion to independent claim 1.

The Examiner finds Tsai discloses an ultrasonic device comprising

cascaded multiple Fourier horns that does not have an internal passage wherein the horns are within the internal passage as required by independent claim 1. (Final Act. 6.) The Examiner further finds Tsai does not disclose that the tube or the horns are additively manufactured. (Final Act. 7.) The Examiner finds Kinley discloses an ultrasonic apparatus comprising cascading ultrasonic horns inside a tube with multiple bends that is non line of sight and comprising first and second flanges. (Final Act. 6.) The Examiner finds Ford discloses that additive manufacturing may be used to make articles of complex shapes through a passageway that may be tortuous. (Final Act. 7 (citing Abstract, Figures 1–7).) The Examiner determines it would have been obvious to incorporate the tube with multiple bends that is non line of sight and comprising first and second flanges of Kinley into the ultrasonic device of Tsai because it is well-known in the art to do so, and doing so amounts to nothing more than using known structural features in a known environment to accomplish an entirely expected result. (Final Act. 7.) The Examiner further determines that it would have been obvious to manufacture the ultrasonic device of modified Tsai using additive manufacturing techniques as disclosed by Ford because it is well-known in the art to do so, and doing so would amount to nothing more than using a conventional manufacturing technique in a known environment to accomplish an entirely expected result. (Final Act. 7.)

Appellant argues the Examiner has not provided a proper reason to combine the cited references. Specifically, Appellant argues Tsai is directed to a method for transporting a liquid for atomization and a method and devices for atomizing the same. (Appeal Br. 11.) Appellant argues Tsai's Fourier horns are not utilized for anything related to additive manufacturing

or even manufacturing in general. (Appeal Br. 12.) Appellant argues Kinley is directed to a liquid ethanol process. (Appeal Br. 12.) Appellant argues Ford has a generic teaching of additive manufacturing and makes no reference to cleaning of a non line of sight passage or anything which would suggest modification of a manufacturing process. (Appeal Br. 13.) Appellant further argues the only motivation to make the combination as proposed is based on hindsight. (Appeal Br. 13.)

The Examiner bears the initial burden of presenting a prima facie case of obviousness. *In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992). “[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) (quoted with approval in *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007)).

The subject matter of independent claim 1 is directed to a component, comprising an internal passage and multiple ultrasonic horns, additively manufactured, within the internal passage. The multiple ultrasonic horns function to clean the internal passage of conglomerated powder subsequent to additive manufacturing of the component. The Examiner has failed to direct us to evidence that the combination of Tsai, Kinley, and Ford describes or suggests a component comprising an internal passage with multiple ultrasonic horns contained therein, as claimed. As the Examiner notes, Ford describes additive manufacturing of various components wherein the internal passage comprises removable components, such as chain links or interconnected sections, which function to clean the unprocessed product

material from internal passage. Ford Abstr., Figures 1 and 2. Ford further discloses:

[O]ther specific types and construction of removable components can be formed within the passageway of the intermediate object during the additive manufacturing method provided that they are capable of being physically removed from the passageway and that any unprocessed powdered material remaining within the passageway is at least partly removed by the removable component as it is withdrawn by the user.

(Ford, paragraph bridging 5–6.)

The Examiner, however, does not establish that the applied references or another prior art reference would have provided one of ordinary skill in the art with an apparent reason to utilize multiple ultrasonic horns within an internal cavity as required by the claimed invention. Thus, we agree with Appellant that the Examiner benefitted from impermissible hindsight in combining the teachings of the cited art to arrive at the subject matter of claim 1. Appeal Br. 13; *see In re Warner*, 379 F.2d 1011, 1017 (CCPA 1967) (“A rejection based on section 103 clearly must rest on a factual basis, and these facts must be interpreted without hindsight reconstruction of the invention from the prior art.”).

Accordingly, we do not sustain the Examiner’s rejection of claims 1–9 and 20–25 under 35 U.S.C. § 103 over the combination of Tsai, Kinley, and Ford.

CONCLUSION

Because neither of the affirmed rejections reach all the claims, our decision is an affirmance in part.

In summary:

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
20–24	112(a)	Written Description	20–24	
4, 6, 8, 9, 20, 22, 24	112(b)	Indefiniteness	6, 8, 9, 20, 24	4, 22
1–9, 20–25	103	Tsai, Kinley, Ford		1–9, 20–25
Overall Outcome			6, 8, 9, 20–24	1–5, 7, 25

TIME PERIOD FOR RESPONSE

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a). *See* 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED IN PART